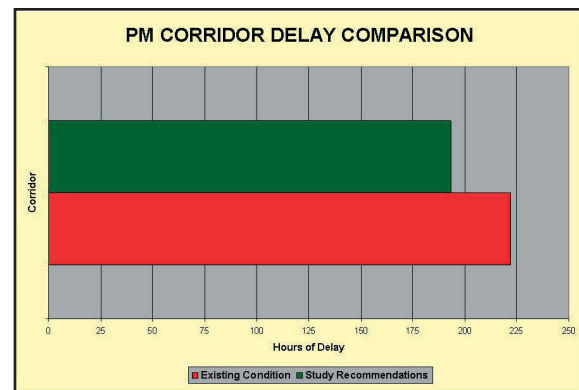
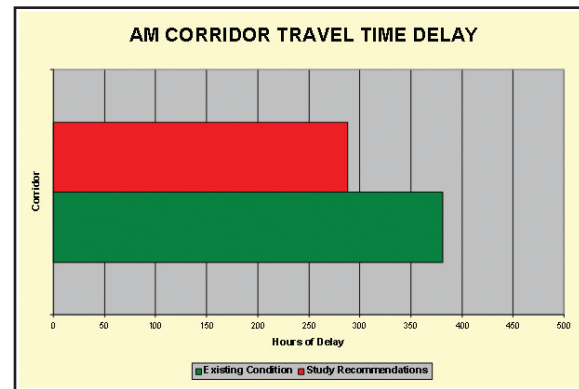


by the U.S. Congress to document and estimate the cost of motor vehicle crashes. Based on these figures, an estimated total of \$37,760,000 worth of economic loss was experienced in these communities over three years (1998, 1999, and 2000).

Congestion

The intersection and operational improvements recommended in this plan will greatly reduce traffic delay. The graphic below shows that by making intersection and signal timing improvements the overall corridor delay can be reduced significantly. Over 100 hours in the AM period will be reduced, and over 30 hours in the PM. The resulting cost saved by these improvements in the AM and PM periods alone equate to approximately \$430,000 per year.



Air Quality

Once implemented, the recommendations outlined in this plan will contribute to the region meeting clean air goals and improving quality of life. Overall, air quality pollutant levels can be reduced by more than 30%, which equates to more than 19,500 gallons of fuel saved.

Air Quality Benefits

Pollutant	% Reduced
NOx	= 37%
VOC	= 34%
CO	= 36%

Contact Information

Jerry Bobo
Houston-Galveston Area Council
3555 Timmons Lane, Suite 120
Houston, Texas 77027
Phone: (713) 627-3200
Fax: (713) 993-4508
E-mail: jerry.bobo@h-gac.com

Kurt Schulte, AICP
Kimley-Horn and Associates, Inc.
12700 Park Central Drive, Suite 1800
Dallas, Texas 75251
Phone: (972) 770-1300
Fax: (972) 239-3820
E-mail: kurt.schulte@kimley-horn.com

CONCLUSION

The success of the FM 518 Corridor Access Management Plan is dependent on the formation or strengthening of partnerships among the variety of involved entities. This section seeks to clearly identify the roles and responsibilities of each agency in meeting the goals of this study.

Steps

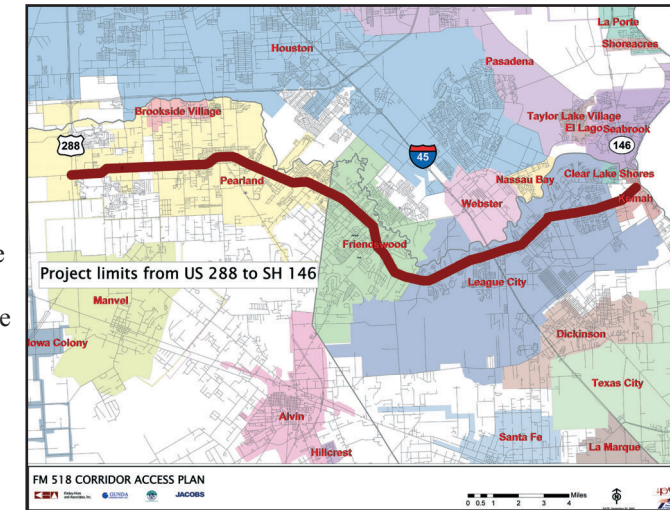
Step	Agency
1. Policy board approval of study	H-GAC
2. Secure funding for short-term intersection improvements	H-GAC and TxDOT
3. Implement intersection improvements	TxDOT
4. Implement system-wide signal retiming	TxDOT and Cities
5. Secure funding for median improvements	H-GAC and TxDOT
6. Implement median improvements	TxDOT
7. Coordinate with TxDOT for median aesthetics	Cities
8. Identify funding and implement bike pedestrian improvements	H-GAC, TxDOT, and Cities
9. Adopt FM 518 Corridor Access Plan by ordinance	Cities
10. Program long-range thoroughfare improvements	Cities
11. Update comprehensive plans and subdivision standards	Cities

This corridor plan attempted to gain the input and concurrence of local business leaders, stakeholders, city officials, regional leaders, and the general public. It is clear from the technical analysis and public process that implementing the short-term intersection improvements and system-wide signal retiming will provide the greatest relief in terms of operations. Additionally, installing raised medians at high crash locations in the short-term will provide safety benefits to the traveling public. The medium and long-range improvements that are contained herein can be implemented as funding and need arises. To develop the remainder of the corridor it is critical that the long-term policy recommendations are incorporated into each city's suite of development regulations.

This will allow for the corridor to develop in a more sustained manor. Incremental improvements will provide relief, but long lasting sustainable corridor success will only be achieved if some level of discipline is exercised to control access to developments.

Executive Summary

This study was commissioned by the Houston-Galveston Area Council (H-GAC), a voluntary association of local governments, and local elected officials in the 13-county Gulf Coast State Planning Region. H-GAC and the Texas Department of Transportation (TxDOT) recognize developing a viable transportation system not only includes building new roadways and adding transit, but managing the access and demand for travel on these systems.



Study Area Map

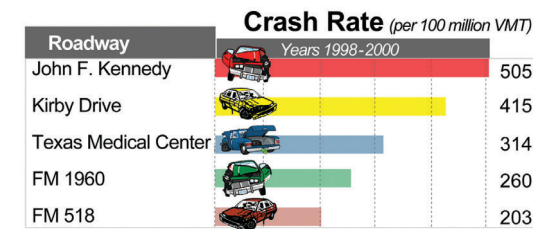
The FM 518 roadway from US 288 to SH 146 was identified as a corridor that is experiencing rapid growth, safety concerns, and traffic congestion. This major east-west roadway is 25.5 miles long. The majority of these miles consist of a five-lane cross-section with four mainlanes and one two-way left-turn lane.

The purpose of this corridor study is to identify transportation measures that will improve public safety and traffic flow, reduce motorist delay, enhance air quality, and improve pedestrian and bicycle access. The FM 518 corridor defines the term "intergovernmental coordination," bisecting four cities, two counties, being a TxDOT facility, and under the H-GAC umbrella. The cities involved in this study are Pearland, Friendswood, League City, and Kemah. Also, Brazoria and Galveston Counties and multiple land developers have played a major role in providing guidance to the study team.

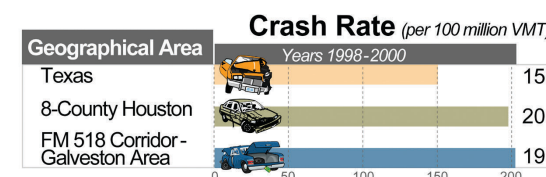
CURRENT CORRIDOR CONDITIONS

Safety: FM 518 has one of the most hazardous crash rates when compared to other roads in the region and the state as a whole.

The graphics below illustrate this point. By geographically analyzing the crash date, the study team documented crash hot spots.



H-GAC Crash Rates



Comparison of Crash Rates

This information is valuable in determining mitigation strategies for intersection improvements, median separations, and driveway consolidations.

Congestion: Level-of-service (LOS) was determined for FM 518 using Synchro™ software, which simulates actual traffic conditions by inputting roadway geometrics, daily traffic volumes, and signal timing and cycle length. The simulation indicated significant congestion levels during both the PM and AM peak travel times. These conditions were verified during field observations.

Generally, each person traveling along FM 518 is experiencing 15 minutes of delay in the AM peak and 10 minutes in the PM peak. Essentially, commuters using the FM 518 corridor waste an average of one week stuck in traffic over a one year period. This lost time contributes to lost productivity at work, depleted family times, and road rage.

PUBLIC INVOLVEMENT

The public meeting component of the outreach effort comprised two series of meetings, each made up of three meetings (one in each city of Pearland, Friendswood, and League City/Kemah). These meetings intended to relay the purpose, process, and progress of the study, and were held in the evenings at venues within each city. This maximized public convenience and allowed discussions to focus in on sub-areas as well as whole-corridor issues.

In addition to the various public meetings, local community and business groups were encouraged to invite project team members to make presentations about the study to their respective groups.

STUDY GOALS

Through an extensive public involvement program and the recognition of the current and projected deficiencies in the FM 518 corridor, the study team established five corridor goals:

- Improve Safety
- Identify Short-Term Transportation Solutions
- Improve Traffic Flow
- Reduce Motorist Delay
- Assess Long-Term Corridor Needs

RECOMMENDATIONS

The study team utilized traffic modeling software, crash analysis techniques, and field verifications to examine the current situation along FM 518. The FM 518 Corridor Stakeholder Committee approved a menu of access management treatments based upon their ability to reduce traffic delay and improve traffic flow and safety for motorists, pedestrians, and bicyclists. The study team then applied these access management techniques to the roadway's most hazardous and congested sections.

The improvements were then presented to the public for review. Based upon these comments, the study team made modifications to the plan, estimated costs, and generated an action plan. The following study recommendations and action plan is the product of a comprehensive public involvement process, coordinated effort amongst all interested parties, and continuation of the partnerships needed for success.

Short-Term Recommendations

The short-term recommendations concentrate on improvements that do not require major purchases of right-of-way (ROW), have a short construction period, and need only minor coordination with property owners. **Tables 1 and 2** detail the short-term intersection and median improvements for the corridor. Also, recommended pedestrian and bicycle improvements can be found in **Table 3**.

Operational improvements include:

- Right-Turn Lane
- Left-Turn Lane
- Signal Timing

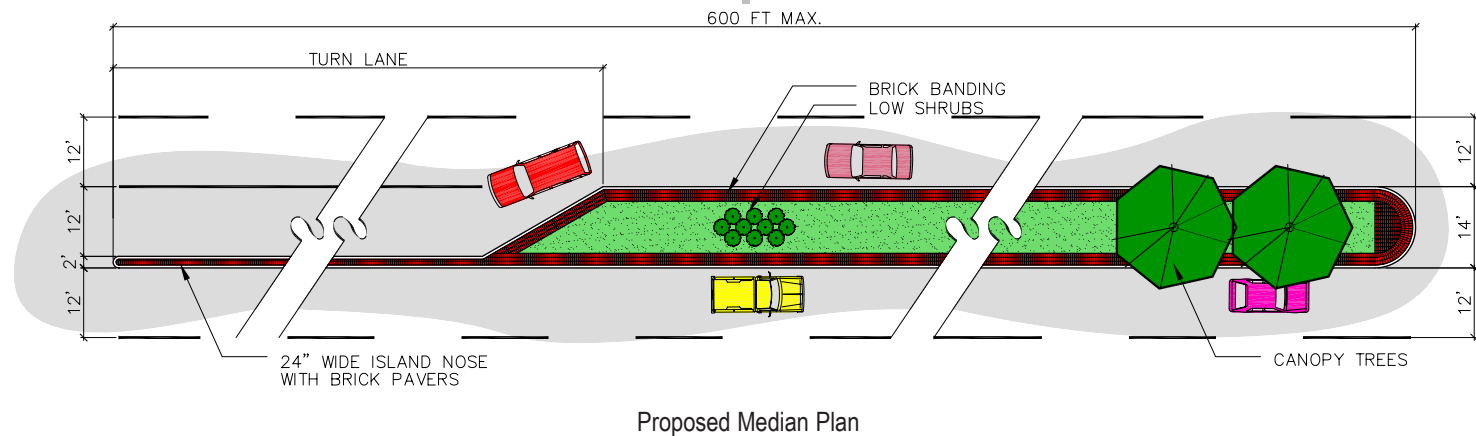
These types of improvements are detailed in **Table 1**.

The study team identified areas where turning traffic, both at the street intersection and at commercial driveways located within the functional area of the intersection, was the major reason for high crash rates. By analyzing the incidents of crashes surrounding each signalized and unsignalized intersection in the corridor, the study team was able to prioritize the application of raised medians. Below illustrates this intersection median concept.

Characteristics of a potential short-term raised median recommendation include:

- Intersection with a high crash rate (>10)
- Adjacent land use has good alternative access ways (driveway on cross street)
- Adjacent land use has adequate internal circulation
- The addition of the raised median has limited safety benefits, but does contribute aesthetically to a gateway feature

The short-term raised medians will be implemented in the next one-to-two years. **Table 2**



Traffic conditions modeling is one of the primary tools that transportation planners and engineers use to evaluate current and future corridor conditions. Using current intersection traffic counts and Synchro™ software, the study team evaluated every signalized intersection. As mentioned in the Current Corridor Conditions, many intersections are operating at an unacceptable LOS. Based on current traffic counts, field observation, and public involvement, the study team tested various intersection improvement options in an attempt to optimize both the intersections and the overall corridor mobility. This process involved not only modeling recommended physical improvements such as left-turn and right-turn lanes, but also included optimizing the intersection phasing, timing, and offsets.

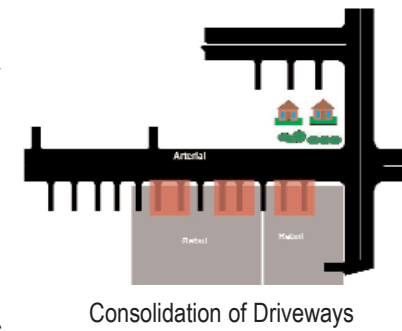
indicates the extents of the short-term raised median improvements. Safety improvements include raised medians at hazardous intersections.

The study team also identified corridor-wide improvements:

- Incorporating isolated traffic signals into a closed-loop system and optimizing all signals for current traffic
- Early warning signage of approaching major intersections
- Continuous street lighting of similar strength and spacing
- Identifying agencies or groups to landscape new medians and ROW
- Adding back panels to signal heads to reduce glare
- Addition of block numbers to overhead street signs

Medium-Term Recommendations

The medium-term recommendations were prioritized based upon their ability to improve mobility, reduce hazardous roadway conditions, and reduce traffic delay. These improvements attract a greater level of funding, typically are beyond the ROW line, and may require extensive coordination with property owners. The improvements listed in **Tables 4 and 5** represent the major modifications called for to make FM 518 a safer and more accessible roadway. The medium-term recommendations call for driveway consolidations, increased cross and shared access between developments, raised medians, new traffic signals, pedestrian /bicycle accommodations (**Table 6**), and programs to increase transit potential.



Long-Term Recommendations

The long-term recommendations focus on changes to land use and transportation policy, future thoroughfare plans, transit opportunities, and future pedestrian /bicycle accommodations. These improvements require ample funding, planning, coordination, and persistence. Nevertheless, they are very important to reaching the community vision of what the corridor will look like in the future.

One of the most important long-term recommendations is the creation of a corridor overlay district. The overlay would dictate the spacing of access connections to FM 518, as illustrated in the adjacent table, and set guidelines for land use decisions and transportation enhancements.

Posted Speed (mph)	Distance (ft)
≤30	200
35	250
40	305
45	360
≥50	425

The result of the corridor overlay district will be a roadway and land development pattern that is more sustainable, aesthetically pleasing, and economically vibrant. Getting from the adjacent picture to the rendering below depends on implementing the long-term recommendations of this study, which include:



Before Access Management

- Coordination with TxDOT
- Shared- and Cross-Access Provisions
- Thoroughfare Planning
- Design Guidelines

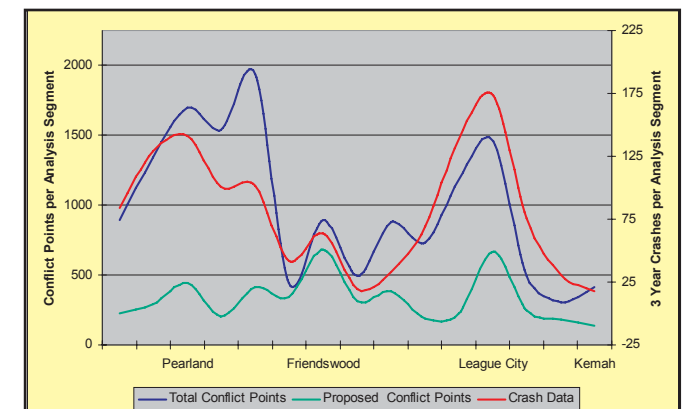


After Access Management

RESULTS

Safety

The application of a raised median in the FM 518 corridor has the potential to reduce crashes. The graphic shown below illustrates the relationship between crash rates and conflict points. As you can see, there is a direct correlation between the corridor crash rates and conflict points. Also, as shown by the green line, as a median barrier is added the conflict points can be dramatically reduced. The National Safety Council was recently commissioned



FM 518 CORRIDOR ACCESS PLAN COST ESTIMATES

Intersection		Add Capacity	Timing Change	Cost Estimate
ID	Name			
Pearland				
2	SH 288 East Side	WB (Right)	RT Overlap	\$28,000
3	Silverlake Village	NB (Right, Through, Left), SB (Left, Shared Right-Through)	Split-phased	\$8,500
4	Wal-Mart	NB (Left, Shared Right-Through), SB (Left, Shared Right-Through)	Split-phased	\$8,000
5	CR 94 / Home Depot	NB (Dual Left, Shared Right-Through), SB (Left, Shared Right-Through)	Split-phased	\$8,500
8	FM 865 / Cullen	SB (Left, Through, Right)	Split-phased	\$8,000
9	CR 89 / Kroger		Split-phased	\$5,000
10	FM 1128	NB (Dual Left, Shared Right-Through), SB (Left, Through Right)	Split-phased	\$19,000
11	Harkey / Oday	NB (Left, Through, Right), SB (Left, Shared Right-Through)		\$20,500
13	Halbert / McLean	Halbert one-way	Single phase	\$8,000
15	SH 35 / Main	WB (Right)	Add logic plan	\$20,000
17	Old Alvin	WB (Right)		\$11,000
18	Walnut / Berry Rose		Right-turn overlap	\$8,000
20	Westminster		Single phase	\$5,000
21	Pearland Parkway	EB&WB (Right), NB (Dual Left, Through, Right-Through)		\$55,000
22	Liberty	EB (Right), NB and SB (Left, Shared Right-Through)	Add quad-left	\$32,000
Friendswood				
28	FM 2351 / Edgewood	SEB(Right)		\$24,000
33	Whispering Pines	NWB (Left)		\$8,000
35	FM 528 / Parkwood	SWB (Dual left)		\$14,000
League City				
36	Bay Area Boulevard	WB (Right)		\$23,000
37	Spring Landing / Palomino	NB&SB (Left) Restripe Lanes	Add quad-left	\$18,500
51b	FM 2094	WB (Extend inside left lane to accommodate queue)		\$5,000
Kemah				
57a	Wal-Mart	Recommend TxDOT signal warrant be conducted	New signal	\$0
Short-Term Intersection Improvement Total				\$337,000

Table 1: Short-Term Intersection Recommendations

Intersection #	Map #	Location	Feet of Median	Cost Estimate
Pearland				
2	1	West of SH 288 Intersection to Silver Lake	700	\$30,000
3,4	1,2	Silver Lake Village Drive / Wal-Mart	700	\$30,000
6	2	Miller Ranch CR 93	1,200	\$51,600
7	3	Southwick Road	1,500	\$64,500
8, 9	5	Cullen (FM 865) & Old Chocolate Bayou CR 89	2,000	\$86,000
10	6	Manvel Road (FM 1128)	1,050	\$45,150
11	8	Harkey / Oday	900	\$38,700
11a	9	Hatfield	650	\$27,950
12	9	Woody / Corrigan	1,200	\$51,600
13	9	McLean / Halbert	700	\$30,100
14	10	Mykawa	450	\$19,350
26	16	Dixie Farm	1,400	\$60,200
Friendswood				
35	23	FM 528 Parkwood	1,200	\$51,600
League City				
36	28	Brookdale/ Bay Area Boulevard	2,400	\$103,200
41 and 42	32	Royal — Hobbs / Lafayette to west of IH-45	1,000	\$43,000
43 and 43a	32	East of IH-45 to 40-feet east of Wesley	1,300	\$59,900
43a	33	Highland Drive	600	\$25,800
44	33	Devereux / Calder to Englewood	1,300	\$55,900
45	33	Interurban	1,200	\$51,600
Short-Term Median Improvement Total				\$922,150

Table 2: Short-Term Raised Median Recommendations

Intersection	Mitigation Measure	Cost Estimate
Pearland		
3 – Silver Lake Drive	Re-Stripe lanes will allow concurrent north-south pedestrian movement	The cost of these improvements are reflected within the short term intersection improvements
4 – Wal-Mart Driveway	Re-Stripe lanes will allow concurrent north-south pedestrian movement	
5 – CR 94A / Home Depot	New lanes and re-striping of lanes will eliminate split-phasing and decrease pedestrian wait time	
18 – Walnut / Barry Rose	Prohibit pedestrian movement on east side of intersection and associate new crossing with Barry Rose phase	
19 – Sherwood	Prohibit pedestrian crossings on west side of intersection and instruct to cross on east side	
League City		
41–Hobbs / Lafayette	Retain split-phasing, but restrict pedestrian crossings on the east side	
45 – Interurban	Associate pedestrian signal interval with higher volume northbound movement	

Table 3: Short-Term Pedestrian and Bicycle Improvements

Intersection		Add Capacity	Cost Estimate
ID	Name		
Pearland			
3	Silverlake Village	*EB (Right) SB (Left, Through, Right)	\$30,000
7	Southwick	EB (Right)	\$15,000
8	FM 865 / Cullen	SB (Dual Left, Through, Right)	\$20,000
13	Halbert / McLean	Halbert Cul-de-sac	\$7,000
15	SH 35 / Main	EB (Dual Left, Right), NB and SB (Dual Left, Right)	\$60,000
22	Liberty	NB and SB (Left, Through, Right)	\$40,000
26	Dixie Farm	WB and EB (Dual Left, Right)	\$50,000
Friendswood			
28	FM 2351 / Edgewood	NEB and SWB (Left), SEB (Right)	\$55,000
35	FM 528 / Parkwood	SWB (Right), NEB (Dual left)	\$45,000
League City			
38	Landing Boulevard	WB (Dual Left)	\$25,000
41	Hobbs / Lafayette	WB (Dual Left), NB (Dual Right) Widen Hobbs 2 SB lanes	\$55,000
42	IH-45 West Side	EB (Dual Right) Begin new right as additional auxiliary lane	\$140,000
43	IH-45 East Side	EB (Dual Left)	
45	Interurban	NB (Left)	\$25,000
46	SH 3	SB (Right) NB,SB,EB, and WB (Left)	\$95,000
50	Texas	NB (Dual left, shared Right)	\$20,000
51b	FM 2094	Develop new NB roadway (create a partial continuous flow intersection)	\$680,000
Medium-Term Intersection Improvement Total			\$1,342,000*
* Estimate does not include ROW cost, which could total 20% to 40% of project cost.			

Table 4: Medium-Term Intersection Recommendations

Intersection #	Map #	Location	Feet of Median	Cost Estimate
Pearland				
10a	7	Roy Street	550	\$23,650
10b	7	Garden Road	750	\$32,250
14a	10	East of Pearland Drive to west of Texas Drive	1,000	\$43,000
15	11	SH 35	750	\$32,250
16	11	Galveston Road	700	\$30,100
17	11	Old Alvin	1500	\$64,500
18	12	Barry Rose	1,200	\$51,600
20	12	Westminster	900	\$38,700
21	13	Pearland Parkway	1,500	\$64,500
22	13 and 14	Liberty Drive	1,250	\$53,750
23	14	Yost / Shadycrest	740	\$31,820
24	15	Woodcreek	1,000	\$43,000
Friendswood				
43a	24 - 27	Lakeview to Eastern City Limit	6,600	\$283,800
League City				
-	27	Western City Limit	2,100	\$90,300
38	31	Landing Boulevard	600	\$25,800
Medium-Term Improvement Total				\$909,020

Table 5: Medium-Term Raised Median Recommendations

Location	Map #	Improvement Type	Sq. Feet of Concrete	Cost Estimate
Pearland				
Hatfield to McLean south side of FM 518 with a crosswalk at Anthony (midblock)	9	8-foot Multi-use trail	2,900	\$255,200
Anthony to Woody north side of FM 518	9	5-foot Sidewalk	1,000	\$55,000
League City – Kemah				
Spring Landing Boulevard to Landing	29, 30, 31	8-foot Multi-use trail	9,200	\$809,600
FM 2920 to SH 146		12-14-foot Multi-use trail	232,800	\$2,560,800*
Medium-Term Improvement Total				\$3,680,600*
* Facility is being proposed is currently a part of a TxDOT widening project				

Table 6: Medium-Term Pedestrian and Bicycle Recommendations

City	Phase	Improvement Type	Cost Estimate
Pearland	Short-Term	Intersections	\$244,500
Pearland	Short-Term	Medians	\$535,150
Pearland	Medium-Term	Intersections	\$222,000
Pearland	Medium-Term	Medians	\$509,120
Pearland	Medium-Term	Pedestrian / Bicycle	\$310,200
Pearland Total			\$1,805,970
Friendswood	Short-Term	Intersections	\$46,000
Friendswood	Short-Term	Medians	\$51,600
Friendswood	Medium-Term	Intersections	\$100,000
Friendswood	Medium-Term	Medians	\$283,800
Friendswood Total			\$481,400
League City / Kemah	Short-Term	Intersections	\$46,500
League City / Kemah	Short-Term	Medians	\$335,400
League City / Kemah	Medium-Term	Intersections	\$1,020,000
League City / Kemah	Medium-Term	Medians	\$215,000
League City / Kemah	Medium-Term	Pedestrian / Bicycle	\$3,370,400
League City / Kemah Total			\$4,987,300
Total Short-Term			\$1,259,150
Total Medium-Term			\$6,015,520
Grand Total			\$7,289,670

Table 7: Cost Summary of All Short- and Medium-Term Recommendations